1885MNRAS..45..444D

It becomes obvious that the wear has been much less rapid during the last seventeen years than in the first four years of the screw's work, else the two curves would differ much more widely. This is probably because the deeply-cut male and female threads do not at first bear along the whole of the faces, but gradually, by mutual wear, attain to more complete contact of their bearing surfaces.

The discussion of a comparison between Right Ascensions of the Cape Catalogues for 1850 and 1880 appears to be somewhat irrelevant to a paper on screw wear; I therefore defer reply to Mr. Stone's remarks on this subject till a more fitting opportunity.

The Velocity of Meteors. By W. F. Denning.

At the December meeting of the Royal Astronomical Society, and again at the May meeting, certain remarks were made as to the velocity of meteors and the enormous speed necessary to explain the occurrence of fixed, long-enduring radiant points. I wish to say that no such velocities are observed, and that it is impossible the fixed radiants can be explained by this means. I quite agree with the remarks that emanated from Col. Tupman as to the difficulty of accounting for these long-continued showers, and also that the very great velocities indicated by Mr. Proctor have never been recognised. The meteors falling from the stationary radiants, referred to in my paper read at the December meeting, appear to be of ordinary character, and their motions cannot differ essentially from the parabolic velocities exhibited by the planetary streams.

Mr. Ranyard, at the May meeting, asked for information as to whether the speed from any of the assumed fixed radiants had been determined from multiple observations of bolides and large meteors. The velocity has certainly been computed in several instances, and they accord with that of the usual planetary meteors. Of course, there is rather a wide limit of error in estimating the exact durations of flight, the intervals being so transient in most cases; but it is impossible that the meteors can travel at a rate anything approaching that suggested as the only explanation of the long enduring showers.

Let us take the instance of the display from near ε *Persei* at $61^\circ{\cdot}8+36^\circ{\cdot}8$, No. IV. of my list in the *Monthly Notices* for Dec. 1884, p. 101, which I regard as one of the very best cases of stationary radiation. A shooting star of about the 3rd mag. was doubly observed from this shower, at York and Oxford, at $11^h\ 28\frac{1}{2}^m$ on Aug. 10, 1872. The estimated duration was 0·5 second, and the actual length of the path traversed in the atmosphere was 20·4 miles, so that the resulting velocity was about forty-one miles per second. The radiant point was at

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1885MNRAS..45..444D

61°+39° (B.A. Report on Luminous Meteors for 1874, p. 281). A great fireball from the same stream was observed at Bristol and many other parts of England on Nov. 6, 1869, at 6^h 50^m. Prof. Herschel discussed a considerable number of observations, and found the radiant point at 62°+37°. The meteor had a real path of about 175 miles traversed in about five seconds, the velocity being some 35 miles per second, and somewhat greater than that of a body moving in a parabola. I observed the end of this fireball, and believe the duration to be much over-estimated; still, though the motion may have been hyperbolic, it could not have attained a figure anything like the terrific velocities which Mr. Proctor's hypothetical streams must follow.

That this fireball really belonged to the shower near ε *Persei* is rendered conclusive by the fact that on Nov. 3 and 4, 1877, I observed an active display of ordinary swift meteors from the point 61°+35°. I also saw a radiant at nearly the same place on Sept. 7–16 and Nov. 27–Dec. 6, 1877, and the following are the mean relative velocities and length of path as I registered them at the three epochs:—

	Mean Duration.	Mean Length.	No. of Meteors.
	sec.	°	
1877, Sept. 7–16	·23	9·15	10
Nov. 3-4	·30	13·30	10
Nov. 27–Dec. 6	·46	7·30	5

The motions evidently decrease with increase of time as the radiant recedes from the Earth's apex, and this seems a general feature.

Whatever may be the true explanation of the fixed radiants, it is not that which applies to the meteors a velocity many times greater than that of the planetary streams.

Bristol:
1885, *June* 1.

Ephemerides of the Satellites of Saturn, 1885–86.

By A. Marth.

The five inner satellites deviate so little from the plane of the ring that their deviations are most suitably treated as latitudes above this plane, the ascending node N and inclination I of which in reference to the plane of the Earth's equator are here assumed to be

for 1886·0 N = 126°·5510 I = 7°·0016.

The assumed longitudes of the five satellites in their orbits (*i.e.* their longitudes from the ascending node added to the right ascension N of the ascending node reckoned from the point of

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